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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,192	02/12/2004	Torbjorn Sandstrom	2674-000003/US/COA	2748
30593	7590	08/02/2004	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			CHOI, WILLIAM C	
P.O. BOX 8910			ART UNIT	
RESTON, VA 20195			PAPER NUMBER	
			2873	

DATE MAILED: 08/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/776,192

Applicant(s)

SANDSTROM, TORBJORN

Examiner

William C. Choi

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/623,195.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____.  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>0204</u> .  | 6) <input type="checkbox"/> Other: ____.                                    |

## **DETAILED ACTION**

### ***Priority***

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/623,195, filed on 8/29/2000.

### ***Information Disclosure Statement***

Receipt of the Information Disclosure Statement (IDS) with the copies of the references cited therein was received on 2/12/2004. An initialized copy of the IDS is enclosed with this office action.

### ***Drawings***

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The **abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words**. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

### ***Claim Objections***

Claims 1, 11, 13, 19 is objected to because of the following informalities:

Claim 1: on page 27, line 9, "radiation" should be changed to "radiation," and on page 27, line 17, "other" should be changed to "other,".

Claim 11: on page 29, line 4, "radiation" should be changed to "radiation,".

Claim 13: on page 29, line 21, "singal" should be changed to "**signal**".

Claim 19: on page 30, line 12, "singal" should be changed to "**signal**".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 17-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al (U.S. 5,171,965).

In regard to claim 17, Suzuki et al discloses an apparatus for creating a pattern on a photosensitive workpiece (column 2, lines 11-39, Figure 3, "W"), comprising: a light source for emitting light flashes in the wavelength range from EUV to IR (column 1, lines 51-62 and column 5, lines 30-31, Figure 3, "1"), a projection system for directing the emitted light to the workpiece (column 5, lines 31-32, Figure 3, "3"), and a control system arranged to control a trigger signal to the light source for emitting the light flashes (column 5, line 48 – column 6, line 7, Figure 3, "8"), wherein the trigger signal is controlled in order to compensate for flash-to-flash time jitter in said light source (column 2, lines 20-34, column 5, line 48 – column 6, line 6).

Regarding claim 18, Suzuki et al discloses wherein the electronic control system is arranged to control the timing of the trigger signal (column 2, lines 20-34).

Regarding claim 19, Suzuki et al discloses wherein the electronic control system is arranged to control a time offset of the trigger signal (column 2, lines 20-34).

Regarding claim 20, Suzuki et al discloses wherein the offset value is estimated based on a measured delay between a trigger signal and a resulting exposure for at least one of the latest exposure (column 5, line 54 – column 6, line 6).

In regard to claim 21, Suzuki et al discloses a method for creating a pattern on a workpiece sensitive to light radiation (column 2, lines 11-39, Figure 3, "W"), comprising: emitting light flashes in the wavelength range from EUV to IR (column 1, lines 51-62

and column 5, lines 30-31, Figure 3, "1"), projecting the emitted light on the workpiece (column 5, lines 31-32, Figure 3, "3"), controlling a trigger signal for emitting the light flashes in order to compensate for flash-to-flash time jitter (column 2, lines 20-34, column 5, line 48 – column 6, line 6).

Regarding claim 22, Suzuki et al discloses wherein the controlling of the trigger signal involves controlling of the timing of the trigger signal (column 2, lines 20-34).

Regarding claim 23, Suzuki et al discloses wherein a time offset of the trigger signal is controlled (column 2, lines 20-34).

Regarding claim 24, Suzuki et al discloses wherein the offset value is estimated based on a measured delay between a trigger signal and a resulting exposure for at least one of the latest exposures (column 5, line 54 – column 6, line 6).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al in view of Nelson (U.S. 5,523,193).

In regard to claim 1, Suzuki et al discloses an apparatus for creating a pattern on a workpiece sensitive to light radiation (column 2, lines 11-39, Figure 3, "W"), comprising: a light source for emitting light flashes in the wavelength range from EUV to

IR (column 1, lines 51-62 and column 5, lines 30-31, Figure 3, "1"), a projection system creating an image of the modulator on the workpiece (column 5, lines 31-32, Figure 3, "3"), an electronic control system controlling the intensity of the radiation, so that said pattern is printed on the workpiece, wherein said electronic control system is further arranged to control a trigger signal to the light source for emitting the light flashes, said trigger signal being controlled in order to compensate for flash-to-flash time jitter in said light source (column 2, lines 20-34, column 5, line 48 – column 6, line 6), but does not specifically disclose a spatial light modulator (SLM) having a multitude of modulating elements (pixels), adapted to being illuminated by said radiation, an electronic data processing and delivery system receiving a digital description of the pattern to be written, converting said pattern to modulator signals, and feeding said signals to the modulator, a precision mechanical system for positioning said workpiece and/or projection system relative to each other, and wherein the control system controls the position of the workpiece and the feeding of the signals to the modulator.

Within the same field of endeavor, Nelson teaches that it is desirable to implement a spatial light modulator (SLM) having a multitude of modulating elements (pixels), adapted to being illuminated by said radiation (column 3, lines 61-66, Figure 2, "50"), an electronic data processing and delivery system receiving a digital description of the pattern to be written, converting said pattern to modulator signals, and feeding said signals to the modulator (column 3, lines 66-67 and column 4, line 57 – column 5, line 6, Figure 2, "52"), a precision mechanical system for positioning said workpiece and/or projection system relative to each other (column 4, lines 10-21, Figure 4, "58"),

and wherein the control system would inherently control the position of the workpiece and the feeding of the signals to the modulator, in place of a mask system (Figure 1, i.e. as disclosed in Suzuki et al), for the purpose of reducing cost of mask fabrication and for faster production time of workpieces (column 2, lines 9-37 and column 3, line 52 – column 5, line 21, Figure 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the apparatus of Suzuki et al to comprise the claimed components since Nelson teaches that it is desirable to do so for the purpose of reducing cost of mask fabrication and for faster production time of workpieces.

Regarding claim 2, Suzuki et al further discloses wherein the electronic control system is arranged to control the timing of the trigger signal (column 2, lines 20-34).

Regarding claim 3, Suzuki et al discloses wherein the electronic control system is arranged to control a time offset of the trigger signal (column 2, lines 20-34).

Regarding claim 4, Suzuki et al discloses wherein the offset value is estimated based on a measured delay between a trigger signal and a resulting exposure for at least one of the latest exposure (column 5, line 54 – column 6, line 6).

Regarding claim 5, Suzuki et al discloses whereby the light source is a laser, and preferably an excimer laser (Figure 3, "1").

Regarding claim 6, Suzuki et al discloses where the pattern is formed in photoresist (column 5, lines 65-68).

In regard to claim 7, Suzuki et al discloses a method for creating a pattern on a workpiece sensitive to light radiation (column 2, lines 11-39, Figure 3, "W"),



comprising: emitting light flashes in the wavelength range from EUV to IR (column 1, lines 51-62 and column 5, lines 30-31, Figure 3, "1"), controlling the emitted radiation so that said pattern is printed on the workpiece, wherein controlling of the emitted radiation involves controlling of a trigger signal for emitting the light flashes in order to compensate for flash-to-flash time jitter (column 2, lines 20-34, column 5, line 48 – column 6, line 6), but does not specifically disclose modulating the emitted light with a spatial light modulator (SLM) having a multitude of modulating elements (pixels), projecting an image of the modulator on the workpiece and controlling the modulator and the positioning of the workpiece in relation to the projected image, based on a digital description of the pattern to be written, so that said pattern is printed on the workpiece.

Within the same field of endeavor, Nelson teaches that it is desirable to modulate the emitted light with a spatial light modulator (SLM) having a multitude of modulating elements (pixels) (column 3, lines 61-66, Figure 2, "50"), projecting an image of the modulator on the workpiece (column 4, lines 1-5) and controlling the modulator and the positioning of the workpiece in relation to the projected image, based on a digital description of the pattern to be written, so that said pattern is printed on the workpiece (column 4, line 57 – column 5, line 6), for the purpose of reducing cost of mask fabrication and for faster production time of workpieces (column 2, lines 9-37 and column 3, line 52 – column 5, line 21, Figure 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of Suzuki et al to comprise the claimed limitations since Nelson teaches that it is desirable

to do so for the purpose of reducing cost of mask fabrication and for faster production time of workpieces.

Regarding claim 8, Suzuki et al further discloses wherein the controlling of the trigger signal involves controlling of the timing of the trigger signal (column 2, lines 20-34).

Regarding claim 9, Suzuki et al discloses wherein a time offset of the trigger signal is controlled (column 2, lines 20-34).

Regarding claim 10, Suzuki et al discloses wherein the offset value is estimated based on a measured delay between a trigger signal and a resulting exposure for at least one of the latest exposures (column 5, line 54 – column 6, line 6).

In regard to claim 11, Suzuki et al discloses an apparatus workpiece sensitive a light source for creating a pattern on a workpiece sensitive to light radiation (column 2, lines 11-39, Figure 3, "W"), comprising: a light source for emitting light flashes in the wavelength range from EUV to IR (column 1, lines 51-62 and column 5, lines 30-31, Figure 3, "1"), a projection system for creating an image of the modulator on the workpiece (column 5, lines 31-32, Figure 3, "3"), and an electronic control system controlling the intensity of the radiation, in accordance with an intended pattern to be printed and further arranged to control a trigger signal to the light source for emitting the light flashes in order to compensate for flash-to-flash time jitter in said light source (column 2, lines 20-34, column 5, line 48 – column 6, line 6), but does not specifically disclose a spatial light modulator (SLM) having a multitude of modulating elements (pixels), adapted to being illuminated by said radiation and an electronic control system

controlling the position of the image created on the workpiece, the modulation elements of the modulator.

Within the same field of endeavor, Nelson teaches that it is desirable to implement a spatial light modulator (SLM) having a multitude of modulating elements (pixels), adapted to being illuminated by said radiation (column 3, lines 61-66, Figure 2, "50"), an electronic data processing and delivery system receiving a digital description of the pattern to be written, converting said pattern to modulator signals, and feeding said signals to the modulator (column 3, lines 66-67 and column 4, line 57 – column 5, line 6, Figure 2, "52"), in place of a mask system (Figure 1, i.e. as disclosed in Suzuki et al), for the purpose of reducing cost of mask fabrication and for faster production time of workpieces (column 2, lines 9-37 and column 3, line 52 – column 5, line 21, Figure 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the apparatus of Suzuki et al to comprise the claimed components since Nelson teaches that it is desirable to do so for the purpose of reducing cost of mask fabrication and for faster production time of workpieces.

Regarding claim 12, Suzuki et al further discloses wherein the electronic control system is arranged to control the timing of the trigger signal (column 2, lines 20-34).

Regarding claim 13, Suzuki et al discloses wherein the electronic control system is arranged to control a time offset of the trigger signal (column 2, lines 20-34).

Regarding claim 14, Suzuki et al discloses wherein the offset value is estimated based on a measured delay between a trigger signal and a resulting exposure for at least one of the latest exposure (column 5, line 54 – column 6, line 6).

Regarding claim 15, Suzuki et al discloses whereby the light source is a laser, and preferably an excimer laser (Figure 3, "1").

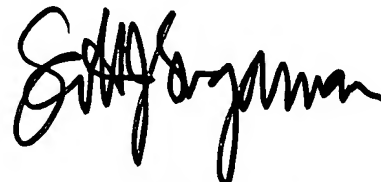
Regarding claim 16, Suzuki et al discloses where the pattern is formed in photoresist (column 5, lines 65-68).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Choi whose telephone number is (571) 272-2324. The examiner can normally be reached on Monday-Friday from about 9:00 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Scott J. Sugarman  
Primary Examiner

William Choi  
PATENT EXAMINER  
ART UNIT 2873  
July 6, 2004